

LEPTON MEASUREMENT AT PHENIX DETECTOR

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Leptons have a large mean-free path for high s allowing them to cross the collision region most likely without further influences. This property makes lepton measurement a valuable tool for time evolution studies starting with the early stages of the collision.

Lepton measurements at RHIC collision energies allow for the possibility to explore QGP signatures like quarkonia (J/ψ , ψ' , χ , Υ) suppression due to color screening and chiral symmetry restoration via light meson modifications. Heavy quarks can be explored using their semi-leptonic decays. Heavy quark energy loss is sensitive to environmental conditions such as temperature and density. Heavy quark anisotropies carry information about thermalization of the matter formed.

The PHENIX detector at RHIC has unique capabilities for measuring electrons and muons (single and pairs). Electrons are measured at mid-rapidity and muons at forward rapidity. In Au+Au and Cu+Cu collisions we quantify in-medium effects. The baseline for the heavy ion results is provided by d+Au and $p+p$ collisions.

In this talk we will show recent results on :

- nuclear modification factor and p_T distributions from J/ψ decays in di-electrons and di-muons compared to models considering cold nuclear effects, color screening, and $c\bar{c}$ recombination
- nuclear modification factor and v_2 of semi-leptonic decays (single electrons and muons) from D and B mesons compared to energy loss models and flow assumptions
- first observations of Υ
- light vector mesons (ϕ and ω) production

We will also show PHENIX upgrades projects and perspectives for future measurements.